153445

VKP series

COMPACT, 40 AMP, OPEN OR SEALED PC BOARD RELAY FOR AUTOMOTIVE APPLICATIONS

FEATURES

- 40A continuous contact rating @ 85°C.
- 1 Form A and 1 Form C arrangements.
- PC board terminals.
- Choice of two footprints.
- Available as open frame or sealed relay.

CONDITIONS

All parametric, environmental and life tests are performed according to EIA Standard RS-407-A at standard test conditions (23°C Ambient, 20-50% RH, 29.5 ± 1.0" Hg.) unless otherwise noted.

CONTACT DATA

Arrangements: 1 Form A (SPST-NO) and 1 Form C (SPDT).
Material: AgNi 0.15 (consult factory for PdCu(5) or other contact materials).
Max. Switching Rate: 20 operations per second with no contact load.
6 operations per minute for rated life at rated load.
Max. Switching Voltage: 75VDC(1).
Max. Load Current (@ 14VDC Load Voltage):

Load	Form A (NO)	Form C	
		NO	NC
Max. Continuous Current	45A	45A	30A
Max. Make Current	100A(2)	100A(2)	30A
Max. Break Current(1)	60A	60A	30A

Max. Switching Power: 50-500 watts DC (voltage dependent)(1).
Min. Recommended Current: 1 amp @ 12VDC.
Initial Voltage Drop: 200 millivolts, maximum, for normally open contacts @ 40 amp contact load.
250 millivolts, maximum, for normally closed contacts @ 20 amp contact load.
Expected Life: 10 million operations, mechanical; 100,000 operations at 40 amps, 14VDC, resistive load on normally open contact.

INITIAL DIELECTRIC STRENGTH

Between Contacts and Coil: 500V rms.

COIL DATA

Voltage: 6, 12 and 24VDC.
Resistance: See Coil Data table.
Nom. Power: 1.6 watts @ 23°C coil temp. and rated coil voltage.
Thermal Resistance: 45°C per actual coil watt in still air with no contact load current.

OPERATE DATA

Must Operate and Must Release Voltage: See Coil Data table.
Initial Operate Time: 5 milliseconds, typical, with rated coil voltage applied.
Initial Release Time: 3 milliseconds, typical, with zero volts applied (for unsuppressed relays after having been energized at rated coil voltage).

ENVIRONMENTAL DATA

Temperature Range: Storage: -40°C to +155°C.
Operating: -40°C to +125°C (4).
Shock: 20 g, 11 milliseconds, half sine wave pulse.
Vibration: (For NC contacts, NO contacts are significantly higher.)
10-40 Hz., 1.27 mm double amplitude.
40-70 Hz., 5 g's constant.
70-100 Hz., 0.5 mm double amplitude.
100-500 Hz., 10 g's constant.
Drop Test: Capable of meeting specifications after a 3.28 foot (1.0 meter) drop onto concrete in final enclosure.
Flammability: UL94-HB or better (meets FMVSS 302).

MECHANICAL DATA

Termination: Printed circuit terminals.
Weight: 20 g (0.7 oz.) approximately.
Enclosure: Sealed relay is suitable for immersion cleaning of PCB assembly or conformal coating. Relay may be vented after cleaning by cutting the vent projection from the corner of the relay after processing using a razor knife or equivalent.

NOTES:

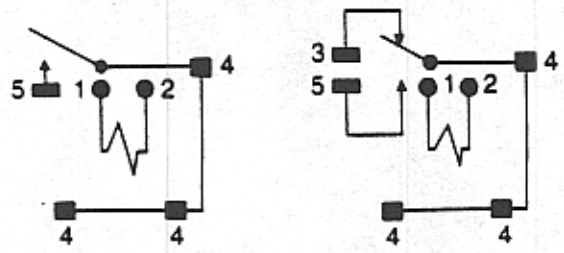
(1) See Figure 1.
(2) Inrush current for lamp load.
(3) Allowable overdrive is rated at ambient temperature for 23°C or 85°C as stated with no load current flowing through the relay contacts and minimum coil resistance. Also see Figure 2 for maximum ambient temperature versus applied coil voltage.
(4) See Figure 2.
(5) PdCu contact material is used for high inrush current loads such as flashers and capacitive loads. Consult factory for load and life information.

COIL DATA (@ 23°C Coil Temperature)

Coil Designator	Rated Coil Voltage (VDC)	Coil Resistance ±10% (Ohms)	Must-Operate Voltage (VDC)	Must-Release Voltage (VDC)	Allowable(3) Overdrive (VDC)	
					@ 23°C	@ 85°C
D	6	19	3.3	0.6	9.0	6.5
F	12	90	6.8	1.2	19.6	14.3
H	24	362	13.9	2.4	39.3	28.6

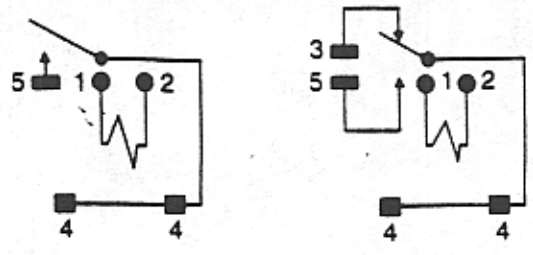
WIRING DIAGRAMS (Bottom View)

OPEN MODELS



1 FORM A 1 FORM C

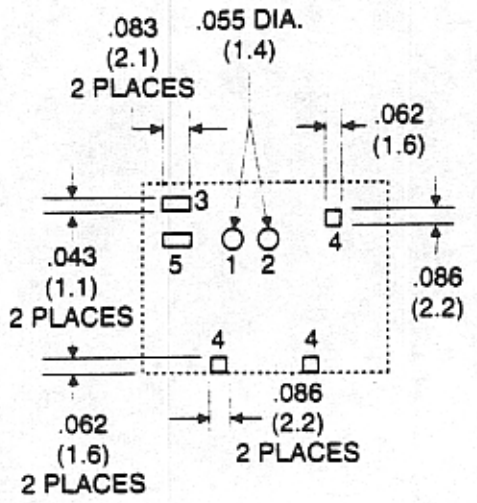
SEALED MODELS



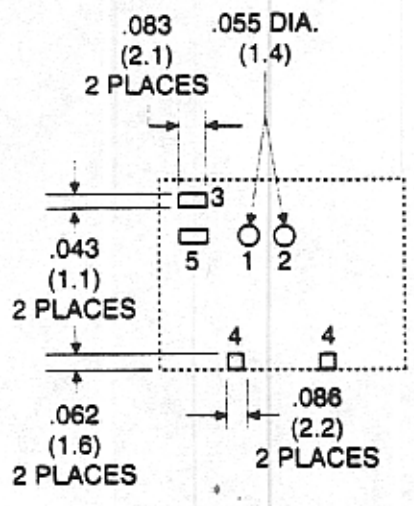
1 FORM A 1 FORM C

SUGGESTED PC BOARD LAYOUTS (Bottom View)

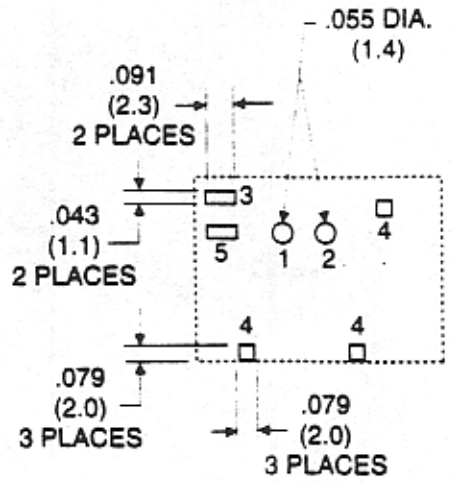
U.S.A. FOOTPRINT OPEN MODEL HOLE SIZE



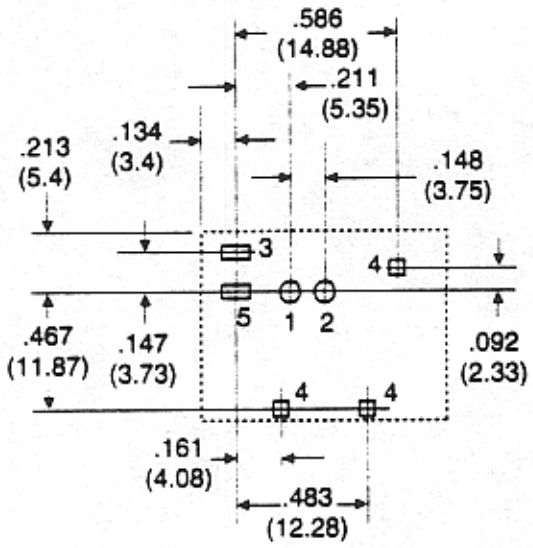
U.S.A. FOOTPRINT SEALED MODEL HOLE SIZE



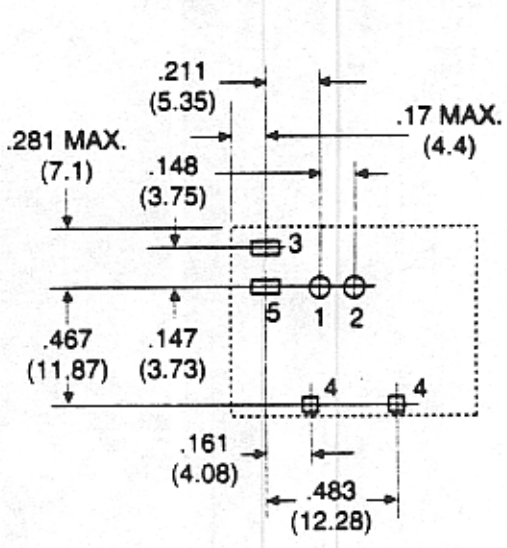
EUROPEAN FOOTPRINT OPEN MODEL HOLE SIZE



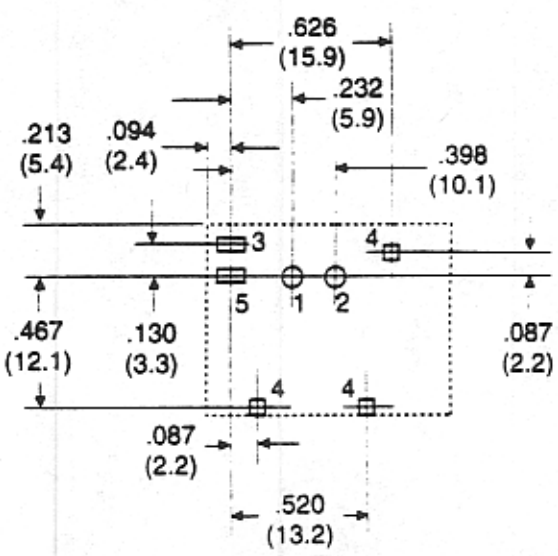
CENTER-TO-CENTER



CENTER-TO-CENTER

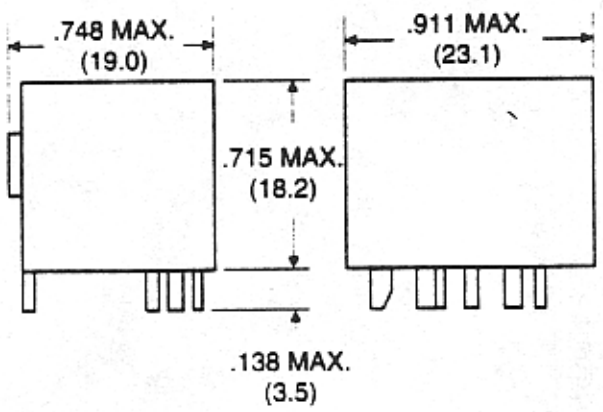


CENTER-TO-CENTER

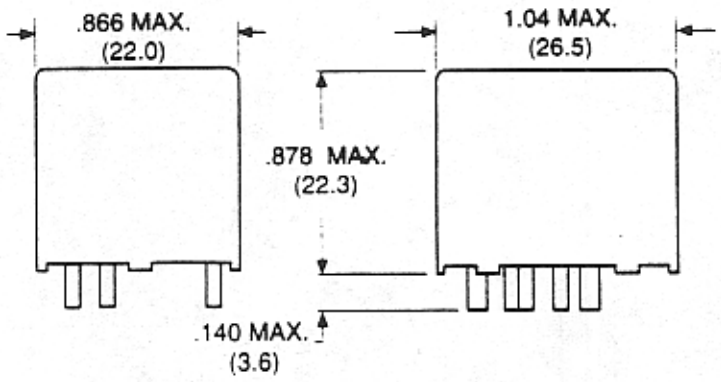


OUTLINE DIMENSIONS

U.S.A. FOOTPRINT OPEN MODEL



SEALED MODEL



EUROPEAN FOOTPRINT OPEN MODEL

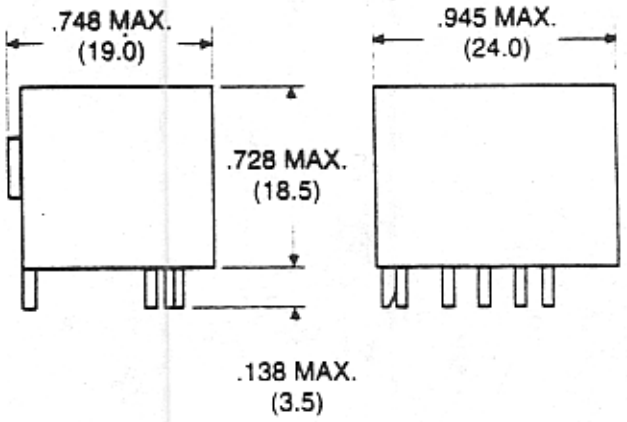
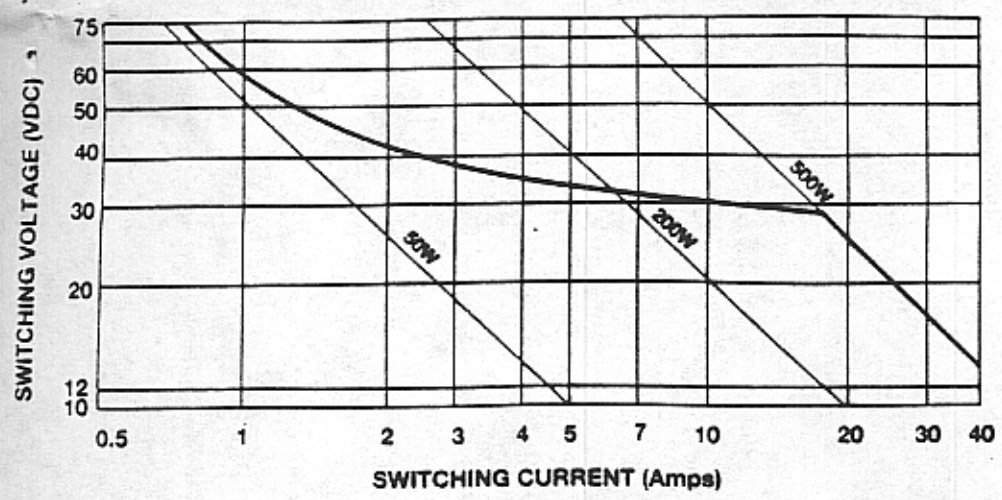
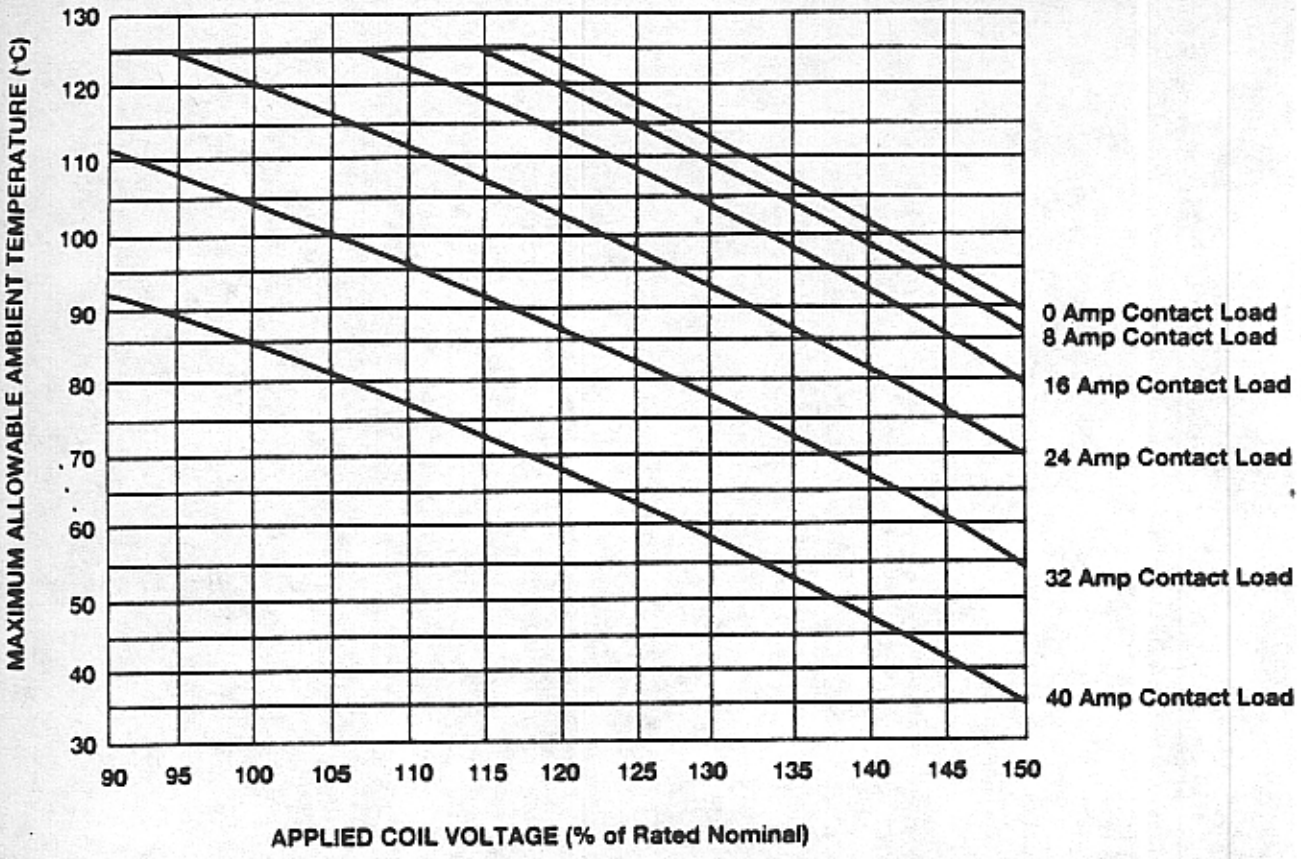


FIGURE 1 – LIMITING CURVE FOR POWER LOAD



Safe breaking, arc extinguished (normally open contact) for resistive loads.

FIGURE 2 – AMBIENT TEMPERATURE VERSUS COIL VOLTAGE FOR CONTINUOUS DUTY



Assumptions:

1. Thermal resistance = 45°C per watt
2. Still air
3. Nominal coil resistance
4. Maximum mean coil temperature = 180°C
5. Coil temperature rise due to load
   = 3.5°C @ 8 amps
   = 10°C @ 16 amps
   = 20°C @ 24 amps
   = 36°C @ 32 amps
   = 55°C @ 40 amps
6. Thermal resistance and power dissipation based on coil resistance at 180°C
7. Curves are based on 1.6 watts at 23°C
8. When full lifetime is at high ambient and high load current, subtract 25°C from maximum allowable ambient temperature.
9. Data is for open relays.

ORDERING INFORMATION

Part Number	Contact Arrangement	Contact Material	Enclosure	Termination Footprint
VKP-11 _ * 42	1 Form A	AgNi 0.15	Open	U.S.A.
VKP-15 _ * 42	1 Form C	AgNi 0.15	Open	U.S.A.
VKP-11 _ * 32 ‡	1 Form A	PdCu/AgNi 0.15	Open	U.S.A.
VKP-15 _ * 32 ‡	1 Form C	PdCu/AgNi 0.15	Open	U.S.A.
VKP-11 _ * 41-K01	1 Form A	AgNi 0.15	Open	European
VKP-15 _ * 41-K01	1 Form C	AgNi 0.15	Open	European
VKP-31 _ * 42	1Form A	AgNi 0.15	Immersion Cleanable Case	U.S.A.
VKP-35 _ * 42	1Form C	AgNi 0.15	Immersion Cleanable Case	U.S.A.

*Standard Coil Voltages: D = 6VDC (Consult factory for availability)
F = 12VDC
H = 24VDC (Consult factory for availability)

‡ Relays with Palladium Copper movable contacts are designed for flashing lamp load applications. Consult the factory for application information.

STOCK ITEMS – (The following VKP series part numbers are normally maintained in stock for immediate delivery:)

VKP-11F32
VKP-11F42
VKP-15F42
VKP-35F42